ORDER NO. SD7807-1422

Service Manual

Direct Drive Automatic Turntable System

SL-3300 (XFE), (ES) / SL-3310 (FEE)

- The model SL-3300 (XFE) is available in East PX only.
- The model SL-3300 (ES) is available in European Military only.
- The model SL-3310 (FEE) is available in European Audio Club only.

- SL-3300 is of silver finish.
- SL-3310 is of black finish.

For additional information, please refer to the service manual for Model No. SL-3300 (X, XAL, XGE, E, XG, XGF)/SL-3310 (E, XG)

Notes: * This service manual includes only the changes of the SL-3300 (X. XAL, XGE, E, XG, XGF)/SL-3310 (E, XG) service manual (ORDER NO. SD7807-1417)
* When servicing models SL-3300 (XFE, ES)/SL-3310 (FEE), this service manual and SL-3300 (X. XAL, XGE. E. XG. XGF)/SL-3310 (E, XG) (ORDER NO. SD7807-1417) service manual should be used together.

CHANGES

- SL-3300 (XFE) → (XFE)
- SL-3300 (ES) → (ES)
- SL-3310 (FEE) → (FEE)

■ REPLACEMENT PARTS LIST

Ref. No.	Change of Part No. SD7807-1417	Change of Part No. → SL-3300 (XFE), (ES) SL-3310 (FEE)	Part Name & Description	Per Set		Remarks
SWITCHES						
S1	SFDSAH764039 V-1A445	SFDSAH764039 (XFE) (ES) (FEE)	Switch, Power	1		
CAPACITORS						
C101	ECQE2A103MZ ECKDHS103SE2	ECQE2A103MZ (XFE) (ES) (FEE)	Polyester, 0.01μF, 250V, ±20%	1		
CABINET and CHASSIS PARTS						
5	SFAC320-01	SFAC320-01 (XFE, ES)	Cabinet (Silver)	1		○
	SFAC321P01	SFAC321P01 (FEE)	Cabinet (Black)	1		○
15	SFNN330X01 SFNN330G01 SFNN330S01	SFNN330X01 (XFE, ES)	Name Plate	1		*○
		SFNN331X01 (FEE)	Name Plate	1		*○
19	SFKK330-01	SFKK330-01 (XFE, ES)	Panel	1		○
	SFKK330P01	SFKK331P01 (FEE)	Panel	1		○
20	SFGK170-01	SFGK170-01 (XFE, ES)	Cap, Rubber (Silver)	1		
	SFGK171F01	SFGK171F01 (FEE)	Cap, Rubber (Black)	1		
21	RJA23ZC-K QFC1208M RJA45ZC-K	RJA48Z-F (XFE) (ES) (FEE)	AC Cord	1		
22	SFUM190-11 SFUM190-12	SFUM190-12 (XFE) (ES) (FEE)	Bushing, AC Cord	1		
54-2	SFUP222S11	Deletion	----------	0		

Technics

Panasonic Tokyo
Matsushita Electric Industrial Co., Ltd.
17-15, 6-chome, Shinbashi, Minato-ku, Tokyo 105 Japan

Matsushita Electric Trading Co., Ltd.
P.O. Box 288, Central Osaka Japan

Ref. No.	Change of Part No. SD7807-1422 → SL-3300 (XFE), (ES) SL-3310 (FEE)			Part Name & Description	Per Set		Remarks
TONE ARM							
78	EPC270C2K-X	EPC74SMED	(XFE) (ES) (FEE)	Cartridge	1		
79	EPS270ED	EPS74STED	(XFE) (ES) (FEE)	Stylus	1		
79-1	SFPEV9801	SFPEV7803	(XFE) (ES) (FEE)	Screw, Cartridge	2		
79-2	SFPEN3302	SFPEN3302	(XFE) (ES) (FEE)	Nut, Cartridge	2		
79-3	SFPEW9601	SFPEW9601	(XFE) (ES) (FEE)	Washer, Cartridge	2		
ACCESSORIES							
A1	SFNU330X01 SFNU330G01	SFNU331P01	(XFE) (ES) (FEE)		1		○
A3	SFPEN3302	Deletion		----------	0		
A3-1	SFPEW9601	Deletion		----------	0		
A3-2	SFCZV8801	Deletion		----------	0		
A3-3	SFPEV9801	Deletion		----------	0		
A3-4	SFYF05A06	Deletion		----------	0		
A4	SFKO135X01E	Deletion		----------	0		
A6	Addition	~~Q~~JP0603S	(FEE)	Adaptor, Gimens	1		
PACKING PARTS							
P1	SFHP330X01 SFHP331S01	SFHP330M01	(XFE) (ES)	Carton	1		○
	SFHP330J01	SFHP331P01	(FEE)	Carton	1		○

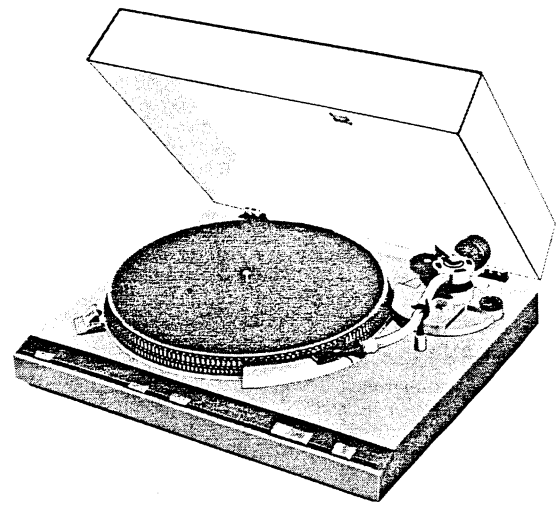
Printed in Japan
7708-900

ORDER NO. SD7807-1417

Service Manual

Direct Drive Automatic Turntable System

SL-3300 (X), (XAL) (XGE), (E) (XG), (XGF) /SL-3310 (E), (XG)



- The model SL-3300 (X) is available in Asia, Latin America, Middle East and Africa only.
- The model SL-3300 (XAL) is available in Australia only.
- The model SL-3300 (XGE) is available in United Kingdom only.
- The model SL-3300 (E) is available in Scandinavia only.
- The model SL-3300 (XG) is available in European only.
- The model SL-3300 (XGF) is available in France only.
- The model SL-3310 (E) is available in Scandinavia only.
- The model SL-3310 (XG) is available in European only.

- SL-3300 is of silver finish.
- SL-3310 is of black finish.

Specifications (Specifications are subject to change without notice for further improvement.)

General

Power supply:	~ 110-120/220-240V, 50 or 60 Hz
Power consumption:	4.5W
Dimensions: (W x H x D)	43.0 x 13.0 x 37.5 cm (16-59/64x5-7/64x14-49/64 inches)
Weight:	7.1 kg (15.7 lb)

Turntable section

Type:	Direct Drive Automatic Turntable System (Auto-start, Auto-return, Auto-stop Repeat play and Manual play)
Drive method:	Direct drive
Motor:	Brushless DC motor
Turntable platter:	Aluminum die-cast, 30.4 cm (12")
Turntable speeds:	33-1/3 and 45 r.p.m.
Pitch controls:	Individual adjustment controls. 100% adjustment range
Wow and flutter:	0.03% WRMS (JIS C5521) ±0.042% peak (IEC 98A Weighted)
Rumble:	−53 dB (IEC 98A Unweighted) −75 dB (IEC 98A Weighted)

Tonearm section

Type:	Universal tubular arm, static-balanced type
Effective length:	230 mm (9-1/16")
Overhang:	15 mm (19/32")
Friction:	Within 7 mg (horizontally and vertically)
Effective mass:	12 g (without cartridge)
Tracking error angle:	Within 2°32′ (at the outer groove of 30 cm (12") record) within 0°32′ (at the inner groove of 30 cm (12") record)
Offset angle:	22°
Adjustable stylus pressure range:	0 to 2.5 g (stylus pressure direct reading type)
Cartridge weight range:	6 to 9.5 g 13.5 to 17 g (including headshell)
(with shellweight):	3 to 6.5 g 10.5 to 14 g (including headshell)
Headshell weight:	7.5 g

Cartridge section (for set with cartridge)

Model No.:	EPC-270C
Type:	Moving magnet
Frequency response:	20 Hz to 25 kHz −3 dB 20 Hz to 15 kHz ±2 dB
Output voltage:	3.2 mV at 1 kHz 5 cm/sec. zero to peak lateral velocity (6.4 mV at 1 kHz, 10 cm/sec. zero to peak lateral velocity [DIN 45500])
Channel separation:	25 dB at 1 kHz
Channel balance:	Within 2 dB at 1 kHz
Compliance (dynamic):	10×10^{-6} cm/dyne at 100 Hz (CBS STR-100)
Stylus pressure:	1.75 ± 0.25 g (17.5 ± 2.5 mN)
Load impedance:	47 kΩ to 100 kΩ
Weight:	6.0 g (cartridge only)
Replacement stylus:	EPS-270SD

Technics

Matsushita Electric Trading Co., Ltd.
P.O. Box 288, Central Osaka Japan

TECHNISCHE DATEN

Allgemeine Daten

Netzspannung: ~110-120/220-240 V, 50/60 Hz Wechselstrom
Leistungsaufnahme: 4,5 W
Abmessungen: (B x H x T) 43,0 x 13,0 x 37,5 cm
Gewicht: 7,1 kg

Plattenspielerteil

Typ: Automatisches Plattenspielersystem mit Direktantrieb, (Auto-Start, Auto-Rückkehr, Auto-Stop, wiederholtes Abspielen und manuelles Abspielen)
Antrieb: Direktantrieb
Motor: Kollektorloser Gleichstrommotor
Plattenteller: Aluminium-Spritzguß 30,4 cm ϕ
Plattenteller-Drehzahlen: 33-1/3 und 45 U/min
Geschwindigkeits-Feineinstellung: Für jede Geschwindigkeit gesondert, mittels Einsteller, 10% Einstellbereich
Gleichlaufschwankungen: 0,03% WRMS (JIS C5521) ±0,042% (IEC 98A bewertet)
Rumpel-Frernd-spannungsabstand: –53 dB (IEC 98A unbewertet)
Rumpel-Geräusch-spannungsabstand: –75 dB (IEC 98A bewertet)

Tonarmteil

Type: Universal-Rohrtonarm, statisch ausbalanciert
Effektive Länge: 230 mm
Überhang: 15 mm
Mechanischer Widerstand: weniger als 7mg (horizontal, vertikal)
Effektive Masse: 12 g (ohne Tonabnehmer)
Spurfehlwinkel: Innerhalb 2°32' (bei der äußeren Rille einer 30 cm-Schallplatte) Innerhalb 0°32' (bei der inneren Rille einer 30 cm-Schallplatte)
Kröpfungswinkel: 22°
Auflagedruck-Einstellbereich: 0–2,5 g (direkt ablesbare Einstellung)
Zulässiger Tonabnehmer Gewicht-bereich: 6–9,5 g 13,5–17 g (einschließlich Tonarmkopf)
(mit Tonarmkopf-Gewicht) : 3–6,5 g 10,5–14 g (einschließlich Tonarmkopf)
Tonarmkopf-Gewicht: 7,5 g

Tonabnehmerteil (für Gerät mit Tonabnehmer)

Modell-Nummer: EPC-270C
Typ: Magnetischer Tonabnehmer
Frequenzgang: 20 Hz to 25 kHz –3 dB 20 Hz to 15 kHz ±2 dB
Ausgangsspannung: 3,2 mV bei 1 kHz. 5 cm/sec Null-zu Spitze, lateral (6,4 mV bei 1 kHz 10 cm/sec Null-zu Spitze, lateral, [DIN 45500])
Kanaltrennung: 25 dB bei 1 kHz
Kanalabweichung: Innerhalb 2 dB bei 1 kHz
Nachgiebigkeit (dynamisch): 10×10^{-6} cm/dyn bei 100 Hz (CBS STR-100)
Auflagekraft: 1,75 ± 0,25 g 17,5 ± 2,5 mN)
Impedanz: 47 kΩ bis 100 kΩ
Gewicht: 6,0 g (ohne Tonarmkopf)
Ersatznadel: EPS-270SD

Änderungen der technischen Daten vorbehalten.

CARACTERISTIQUES TECHNIQUES

Généralités

Alimentation: Alternatif 110-120/220-240 V, 50 ou 60 Hz
Consommation: 4,5 W
Dimensions: (L x H x P) 43,0 x 13,0 x 37,5 cm
Poids: 7,1 kg (15,7 lb)

Platine de lecture

Type: Systéme de platine automatique à entraînement direct, (Auto-démarrage, Auto-retour, Auto-arrêt, Audition répétée et Audition manuelle).
Système d'entraînement: Entraînement par courroie.
Moteur: Moteur C.C. sans balais.
Plateau de lecture: Aluminium moulé sous pression, Diamètre 30,4 cm.
Vitesses de rotation: 33-1/3 et 45 t/p.m.
Commandes de précision de la vitesse: Commandes de réglage individuelles; plage de réglage 10%.
Pleurage et scintillement: 0,03% de valeur efficace (JIS C5521) ±0,042% de crête (IEC 98A Pondéré).
Ronflement: –53 dB (IEC 98A Non-pondéré) –75 dB (IEC 98A Pondéré).

Bras de lecture

Type: Bras tubulaire universel, de type à équilibrage statique.
Longueur effective: 230 mm.
Porte-à-faux: 15 mm
Frottement: Moins de 7 mg (horizontal et vertical).
Masse réele: 12 g (sans la cellule pick-up).
Angle d'erreur de piste: En deçà de 2°32' (au sillon extérieur d'un disque de 30 cm.) En deçà de 0°32' (au sillon intérieur d'un disque de 30 cm.)
Angle de décalage: 22°
Plage de réglage de la pression d'appui: 0 à 2,5 g (type à lecture directe de la pression d'appui de la pointe).
Gamme de poids de la cellule pick-up utilisable: 6 à 9,5 g. 13,5 à 17 g (y compris la coque porte-cellule).
(avec contrepoids de la cellule): 3 à 6,5 10,5 à 14 g (y compris la coque portecellule).
Poids de la coquille porte-cellule: 7,5 g

Cellule pick-up (pour appareil avec cellule pick-up).

No. du modèle: EPC-270C.
Type: Aimant mobile.
Réponse en fréquence: 20 Hz à 25 kHz –3 dB. 20 Hz à 15 kHz ±2 dB
Tension de sortie: 3,2 mV à 1 kHz. 5 cm/sec., Zéro à vitesse latérale de crête. (6,4 mV à 1 kHz, 10 cm/sec, zéro à vitesse latérale de crête [DIN 45500]).
Séparation de canal: 25 dB à 1 kHz.
Equilibrage des canaux: En deçà de 2 dB à 1 kHz.
Elasticité (dynamique): 10×10^{-6} cm/dyne à 100 Hz (CBS STR-100).
Pression de la pointe de lecture: 1,75 ± 0,25 gramme (17,5 ±2,5 mN).
Impédance de charge: 47 kΩ à 100 kΩ
Pointe de lecture de remplacement: EPS-270SD.

Les spécifications sont susceptibles d'être modifiées sans préavis.

■ PARTS IDENTIFICATION

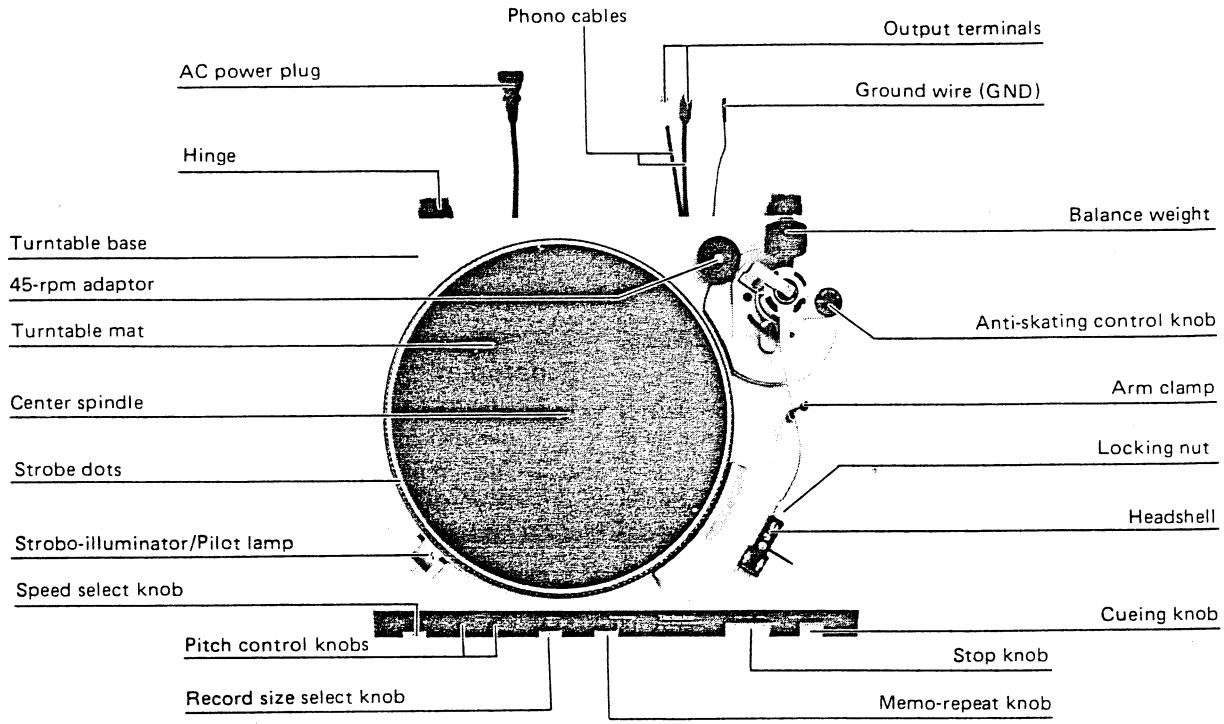


Fig. 1

■ FEATURES

Ultra-Low-Speed Direct Drive Motor

The direct-drive of the SL-3200 eliminates the belts, wheels, and other drive elements required by conventional systems. These same belts and so on are notorious sources of vibration, resonance, and cyclical variations in speed. With only one moving part, the D.D. system does away with these sources of disturbance, to provide superbly smooth, constant platter rotation.

Integral Rotor-Platter Structure

To further simplify the turntable design, the platter and rotor are formed into a single, continuous unit. By eliminating a linkage point, this prevents the potentially disturbing effects of looseness or maladjustment between platter and rotor.

All Front-Panel Controls

The advancement to complete front-panel control marks a big step forward in turntable operation, not only because of the greater convenience, but also because of the greater protection from dust, as the dust cover can stay closed.

Tonearm Cueing Controlled from Front Panel

The tonearm is raised and lowered softly by a viscous-damped cueing lifter. Even with the dust cover closed, a cueing can be easily performed as the control is located on the front panel.

High Sensitive Gimbal Suspension

The recently developed high sensitivity tonearm bearings featured in this unit achieve a very high degree of performance. In addition, the universal-type detachable headshell features all gold-plated pin connections to ensure unwavering reliability through many years of use.

Independent Pitch Controls

Permits record speed (at both 33-1/3 and 45 rpm) to be varied by up to 10%.

Precision Strobe Illuminator/Pilot Lamp

With the built-in strobe illuminator/pilot lamp, accurate speed adjustments can be made rapidly and easily.

Anti-Skating Force Mechanism

The well-designed anti-skating force mechanism ensures minimum side thrust with different cartridges and guarantees accurate center-of-the-groove tracking.

Fully-Automatic Operation

All operations in the SL-3300 are completely automatic, yet mechanical movements are accurate and silent. Full protection to records and stylus tip is assured. With the memo-repeat feature, favorite records may be repeated up to six times, or indefinitely.

Detachable Dust Cover

■ HOW TO OPERATE

Manual play of a record

1. Place a record on the turntable mat.
2. Set the speed select knob to the desired record speed. **(See Fig. 2.)**
3. Remove the stylus protector, if your cartridge has a detachable one.
4. Release the arm clamp.
5. Set the cueing knob to the "▼" position. **(See Fig. 3.)**
6. Move the tonearm over the record and set the cueing knob to the "▼" position. **(See Fig. 4.)**
   The tonearm will descend slowly onto the record and play will begin.
7. When play is finished, the tonearm will automatically return to the arm rest (auto-return), and the turntable platter will stop rotation.
   The turntable platter will continue to rotate briefly due to its own inertia.

   Note:
   If the "**memo-repeat**" knob is in a position other than "**0**" play will be repeated by the number of times set; therefore, be sure to keep the "**memo-repeat**" knob in the "**0**" position.

- After play is completed, fasten the tonearm with the arm clamp and set the speed select knob to the "•" position.
- Attach the stylus protector again, if you have one, to protect the stylus tip from damage.

Automatic play

1. Set the speed select knob in the same manner as in manual play and release the arm clamp.
2. Set the record size select knob to the diameter of the record (7" (17 cm), 10" (25 cm) or 12" (30 cm)) you wish to play **(See Fig. 5.)**
   Note:
- Care should be taken not to move the record size select knob when the tonearm is moving in the automatic start or automatic return cycle.

3. Set the start/stop knob to the "**start**" position. **(See Fig. 6.)**
   The tonearm will move automatically over the lead-in groove and descend slowly to the record (auto-start). Play will begin.
   Note:

- In this case, the "**start/stop**" knob will automatically return to the neutral position after play has begun.

4. When play has finished, the tonearm will automatically return to the arm rest (auto-return) and the turntable platter will stop rotation.
   The turntable platter will continue to rotate briefly due to its own inertia.

   Note:
- If the "memo-repeat" knob is in a position other than "**0**", play will be repeated by the number of times set; therefore, be sure to keep the "memo-repeat" knob in the "0" position.
- After play is completed, fasten the tonearm with the arm clamp and set the speed select knob to the "•" position.
- Attach the stylus protector again, if you have one, to protect the stylus tip from damage.
- Records having size other than 17 cm, 25 cm and 30 cm (7", 10" and 12") should be played manually. Your turntable is designed for automatic handling of records that adhere to accepted industry dimensions. Therefore, use the unit manually for records other than standard sizes.

Repeat play

1. Set the speed select knob and record size select knob in the same manner as in automatic play.
2. Set the "**memo-repeat**" knob to the desired number of times you wish to play. **(See Fig. 7.)**
   "**R**" position enables you to repeat play continuously.
   Subsequently, follow the same procedures as for the automatic (auto-start) play.

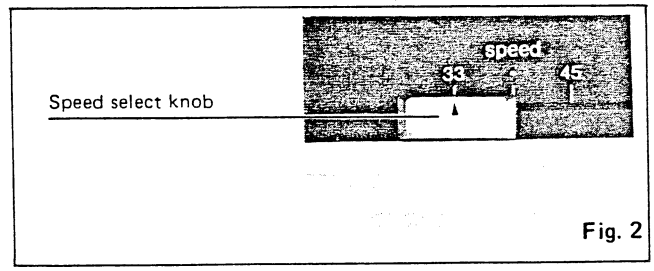


Fig. 2

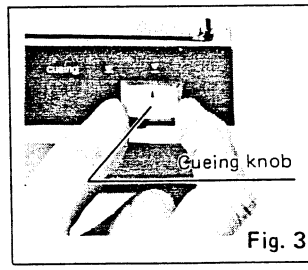


Fig. 3

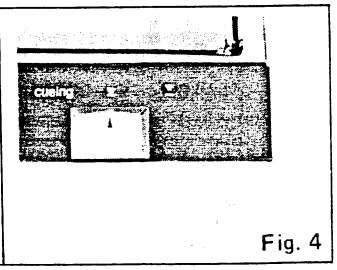


Fig. 4

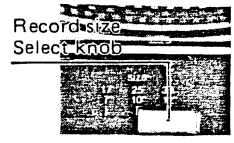


Fig. 5

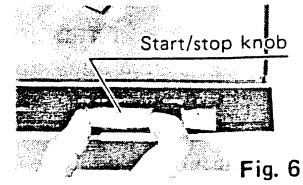


Fig. 6

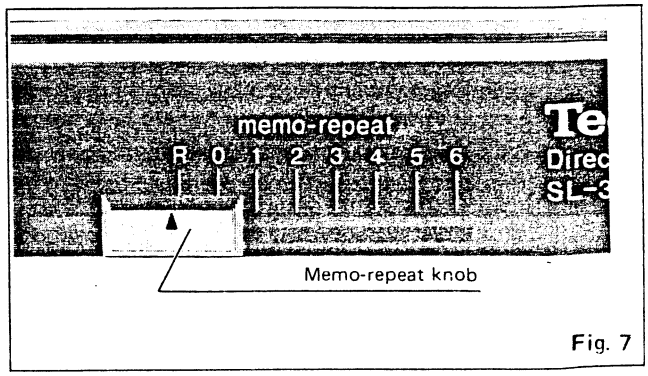


Fig. 7

Note:

- The "**memo-repeat**" knob may be moved either left or right without any inconvenience, but care should be taken not to move it when the tonearm is moving in the automatic start or automatic return cycle.

How to stop play

Set the start/stop knob to the "**stop**" position. **(See Fig. 8.)** The tonearm will automatically return to the arm rest and the turntable will stop rotating.

Note:

- If the "**memo-repeat**" knob is in a position other than "**0**", play will be repeated by the number of times set; therefore, be sure to keep the "**memo-repeat**" knob in the "0" position.

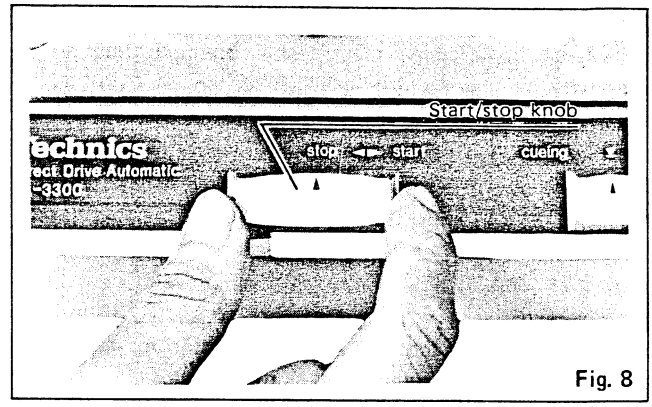


Fig. 8

ADJUSTMENTS

Adjustments of horizontal zero (0) balance and stylus pressure

1. Before adjusting horizontal zero (0) balance, check the following:
   Make sure that the speed select knob is in the "•" (neutral) position.
   Make sure that the cueing knob is in the "▼" position.
   Make sure that the anti-skating control knob is at "0" position.
   Make sure that the "**memo-repeat**" knob is in the "0" position.
2. Remove the stylus protector, if your cartridge has a detachable one.
   Be careful not to touch your fingers to the stylus tip.
3. Release the arm clamp and lift the tonearm from the arm rest to free it.
   Turn the entire balance weight clockwise (indicated by the arrow "**A**") or counterclockwise (indicated by the arrow "**B**") until the tonearm is approximately balanced horizontally (floats freely). **(See Figs. 9 and 10.)**

   Note:

- During the adjustment of the horizontal zero (0) balance, be careful that the stylus tip of the cartridge does not contact the turntable mat or turntable base.

4. After the tonearm is horizontally zero (0) balanced, temporarily refasten the tonearm with the arm clamp.
5. Hold the balance weight stationary with one hand as shown in the picture, and rotate only the stylus-pressure ring to bring the numeral "0" of the ring into alignment with the center line on the tonearm rear shaft.
   The adjustment of the horizontal zero (0) balance is now completed. **(See Fig. 11.)**
6. After adjusting the horizontal zero (0) balance, turn the balance weight clockwise in the direction of the arrow and align to the correct stylus pressure. **(See 12.)**
   (Follow the cartridge manufacturer's recommendation.)
   As the stylus-pressure ring moves in step with the balance weight, proper stylus pressure can be selected by directly reading the graduated ring.

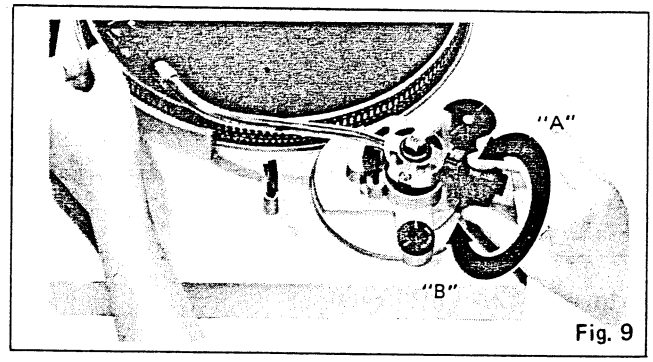


Fig. 9

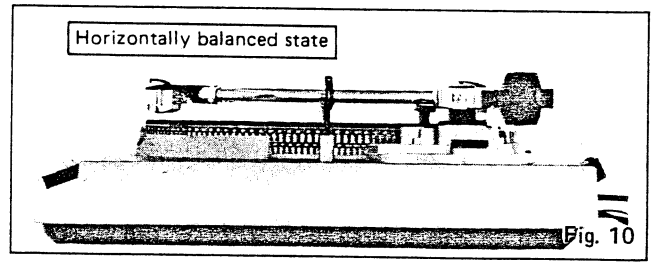


Fig. 10

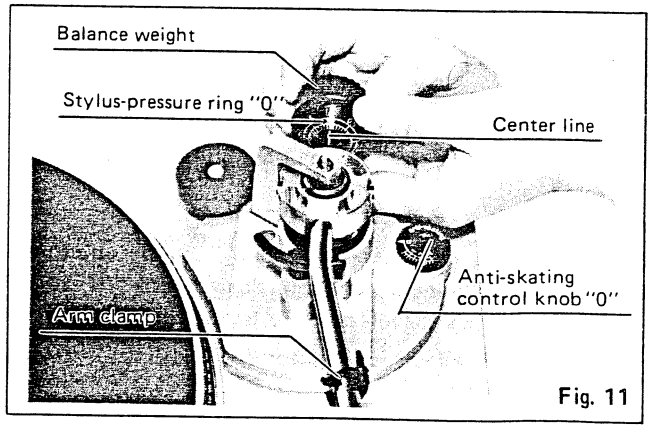


Fig. 11

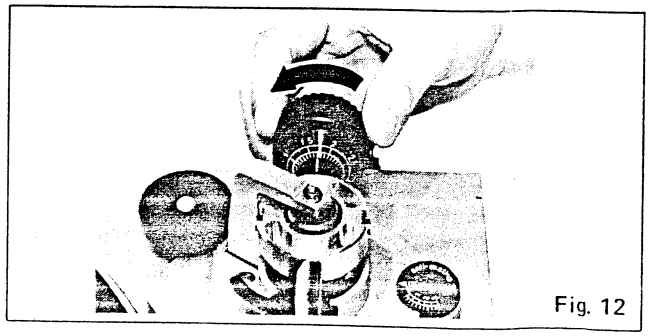


Fig. 12

Note:

- Set the stylus pressure to the maximum recommended value for your cartridge in cases where the record has an extremely high recording level, or where the unit is operated in a room at low temperature, or in places in which the unit is subjected to vibrations.

Adjustment of anti-skating control

Set the anti-skating control knob to the same value as the stylus pressure. **(See Fig. 13.)**

Note:

- When a cartridge with integral dust brush is used, follow the cartridge manufacturer's recommendation for adjusting both stylus pressure and anti-skating force.

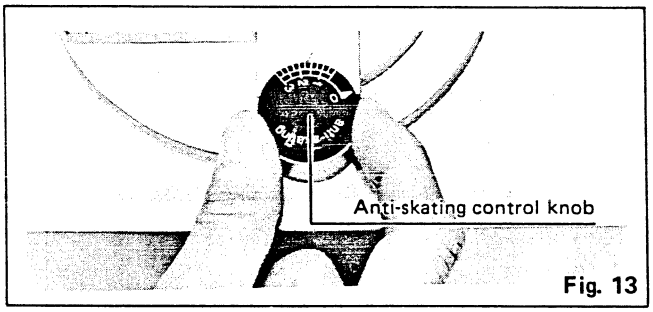


Fig. 13

Adjustment of arm-lift height (See Fig. 14)

- The arm-lift height distance between the stylus tip and record surface when cueing knob is at "▼" has been adjusted at the factory before shipping to approximately 5 to 10 mm.
- For using different cartridges available on the market or when further adjustments are particularly necessary, make adjustment as follows:

4. Turn the adjustment screw clockwise or counterclockwise, while pushing the arm lift down. **(See Fig. 14.)**

Clockwise rotation

— distance between the record and stylus tip is reduced.

Counterclockwise rotation

— distance between the record and stylus tip is increased.

Note:

- As the adjusting screw has a hexagonal head, be sure to make the adjustment while depressing the arm lift, or the screw will not move freely. Also be sure that the hexagonal head retracts correctly into the arm lift when the latter is released.

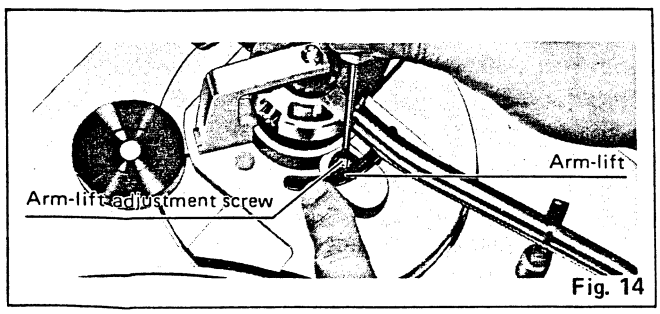


Fig. 14

Speed adjustment (with pitch control knobs)

Strobe dots are set on the rim of the turntable platter according to the power-line frequency and the speed of the records. Make adjustment, referring to strobe-dot indication.

1. Place a record on the turntable mat.
2. Set the speed select knob to the speed to be adjusted.
3. Adjust the speed while playing a record.
   The strobe-illuminator/pilot lamp will be lit for illuminating the strobe dots.
4. While turning the pitch control knobs either to "+" side or "—" side, adjust so that the strobe dots of the turntable platter look as if they were stationary. The state under which the strobe dots seem to be stationary represents the correct number of revolutions.

"+" direction

This increases the speed of the turntable rotation, and the strobe dot pattern seems to flow in the same direction as the rotational direction of the turntable platter.

"—" direction

This decreases the speed of the turntable rotation, resulting in a state opposite to that in the "+" direction.

Note:

Strobe dot pattern

The strobe-illuminator/pilot lamp of this unit employs the commercially available power source. The frequency of such power source, when actually measured, has a fluctuation of about 0.2%. As such a fluctuation of the power source affects the strobe illuminator, the strobe dot pattern also seems to fluctuate to a certain extent.

But the unit is not affected by these fluctuations of the power source, since a DC motor is employed. In other words, rotation of the platter will be constant, and slight shifts in the movement of the dots simply reflect normal drift in the power-source frequency.

Adjustment for automatic start and return positions

Should the tonearm not function correctly, make adjustments according to the following procedures.

Adjustment for automatic start position

(Remove the rubber cap.)

In cases where the stylus tip descends outside of the record
-Rotate clockwise.

In cases where the stylus tip descends onto halfway of a recorded piece
—Rotate counterclokwise.

Adjustment for automatic return position (See Fig. 15.)

(Remove the turntable mat.)

In cases where the tonearm tends to return before playing has finished.

— **Rotate clockwise.**

In cases where the tonearm fails to return after the last groove of the record.

— **Rotate counterclockwise.**

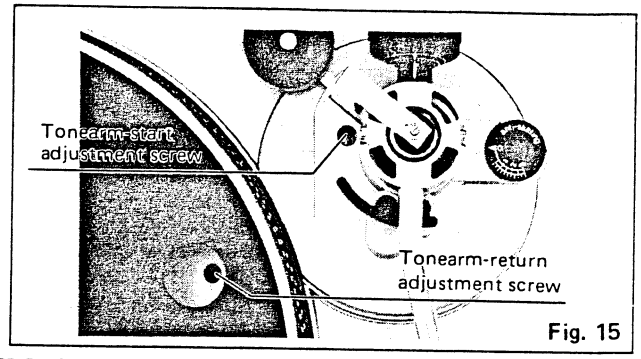


Fig. 15

■ OPERATION PRINCIPLES OF THE SL-3300/SL-3310

This unit, like the SL-1300 has a rational motor structure, and its drive control circuit is the B.F.G. type (Back electromotive force frequency generator) which is constructed on a single integrated Circuit (IC) chip(AN630). The following is a block diagram of the IC (AN630) for which the operating principle will be briefly explained.

TECHNICAL EXPLANATION

■ OPERATING PRINCIPLE

The back electromotive force, which is generated by the drive coil winding according to the rotation of the motor, is detected and converted to a frequency signal that is proportional to the number of revolutions.
Conversion is performed by a wave-shaping circuit and a logic circuit (This is referred to as the B.F.G. method).
This frequency signal is compared with a standard signal by means of a frequency-voltage conversion circuit which converts it to a voltage singal in order maintain a constant number of revolutions.

After removing unnecessary frequency components, with the operational-amplifier active filter, from this voltage signal, it controls the current flow in three differential switching circuits. As a result, the flow of current in the drive coil winding is always constant maintaining the correct rotational speed. Control of the rotational speed can be performed by means of adjusting the standard signal generator circuit according to the rotational speed adjustment circuit.

■ EXPLANATION OF EACH PART

1. B.F.G. METHOD (BACK ELECTROMOTIVE FORCE FREQUENCY GENERATOR)

Making use of the back electromotive force that is generated in the drive coil winding of the motor as a frequency generator, the frequency of the frequency generator is converted to the number of revolutions for the turntable.
After shaping the wave form of this back electromotive force, it is composed logically, and a frequency is generated that is proportional to the number of revolutions. This is the use of the B.F.G. Making use of the drive coil winding, frequency generator coil windings and magnets are not necessary, yielding a motor structure that is very compact.

2. FREQUENCY-VOLTAGE CONVERSION CIRCUIT

Being composed of a trapezoldal wave generating circuit, a pulse generating circuit and a sampling integration circuit, the B.F.G. output frequency is converted to a voltage, and control output voltage is generated in order to maintain the rotational speed of the turntable at a constant level.

3. OPERATION CONTROL CIRCUIT

The operation control circuit functions as a control output voltage control keeping the rotational speed of the turntable constant with regard to the start of turntable operation and the operation of the mechanism. With this circuit, transient response characteristics and starting characteristics are very good.

4. OPERATIONAL AMPLIFIER (OP AMP) ACTIVE FILTER

Because of using an operational amplifier in the active filter, an ideal filter operation is possible.
As a result, such high performance as a signal-to-noise (SN) ratio of 60 dB (IEC-B) and a wow-and-flutter level of 0.03% (WRMS) have been achieved.

5. DRIVE CIRCUIT

By incorporating a large capacity power transistor in the integrated circuit, a starting torque of 1 kg-cm can be obtained. By means of this large starting torque, prompt starts have been realized.

6. THREE DIFFERENTIAL SWITCHING CIRCUITS

By means of the signal from the position signal coil, the starting circuit power transistor selector operates, obtaining smooth rotation.

■ JUSTIERUNGEN

Justierung der horizontalen "0"-Balance und des Auflagedrucks.

1. Bevor Sie die horizontale "0"-Balance justieren, prüfen Sie folgende Punkte:
   Vergewissern Sie sich, daß der Geschwindigkeits-Wahlschieber in der "•"-Position (neutral) ist.
   Vergewissern Sie sich, daß der Lift-Hebel in der "▼"-Position ist.
   Vergewissern Sie sich, daß der Antiskating-Einsteller in der "0"-Position steht.
2. Entfernen Sie den Nadelschutz, falls der Tonabnehmer mit einem abnehmbaren versehen ist. Achten Sie darauf, daß Sie die Nadelspitze nicht mit Ihren Fingern berühren.
3. Stellen Sie den Tonarm durch lösen der Arretierklammer frei, und heben Sie ihn von der Tonarmablage ab.
   Drehen Sie das ganze Gegengewicht im Uhrzeigersinn (Pfeilrichtung "A") oder Gegenuhrzeigersinn (Pfeilrichtung "B"), bis der Tonarm ungefähr in Waage zu liegen kommt (frei schwebend). **(Vgl. Abb. 9 und 10.)**
   Wenn Sie den Tonarm gegen die Plattentellerachse bewegen, so dreht sich der Plattenteller ein wenig, obwohl der Geschwindigkeits-Wahlschieber in der "•"-Position ist. Diese Bewegung ist jedoch unbedeutend.

   Anmerkung:
   - Achten Sie während der justierung der horizontalen "0"-Balance darauf, daß die Abtastnadel nicht mit der Plattentellerauflage oder der Plattenspielerzarge in Berührung kommt.
4. Nachdem der Tonarm horizontal ausbalanciert ist, befestigen Sie ihn vorübergehend mit der Arretierklammer auf der Tonarmablage. **(Vgl. Abb. 11)**
5. Halten Sie das Gegengewicht mit einer Hand fest, wie in der Abbildung gezeigt, und drehen Sie den Auflagedruck-Einstellring, bis dessen "0"-Marke mit der Mittellinie auf dem rückwärtigen Tonarmende übereinstimmt. **(Vgl. Abb. 11.)**
   Die Justierung der horizontalen "0"-Balance ist damit beendet.
6. Nach der Einstellung der horizontalen "0"-Balance, drehen Sie das Gegengewicht im Uhrzeigersinn (in der Pfeilrichtung), und bringen Sie es mit dem korrekten Auflagedruck in Übereinstimmung. **(Vgl. Abb. 12.)**
   (Halten Sie sich an die Empfehlung des Tonabnehmer-Herstellers.)
   Da der Auflagedruck-Einstellring sich zusammen mit dem Gegengewicht bewegt, kann der Auflagedruck direkt am Skalaring abgelesen werden.
   Anmerkung:
   - Wenn das Aufnahmeniveau einer Schallplatte extrem hoch ist, oder, wenn der Plattenspieler an einem Ort benutzt wird, wo Erschütterungen auftreten oder tiefe Temperaturen herrschen, stellen Sie den Auflagedruck auf den höchsten, für Ihren Tonabnehmer empfohlenen Wert ein.

Justierung des Antiskating-Einstellers

Stellen Sie den Antiskating-Einstellknopf auf den gleichen Wert ein, wie den Auflagedruck. **(Vgl. Abb. 13.)**

Anmerkung:
- Wenn Sie einen Tonabnehmer mit einem daran befestigten Pinselchen benutzen, halten Sie sich bei der Einstellung der Auflagekraft und des Antiskatingwertes an die Empfehlungen des Tonabnehmer-Herstellers.

Einstellung des Tonarmlifts (Vgl. Abb. 14.)

Die Tonarmlifthöhe, d.h. der Abstand zwischen der Schallplattenoberfläche und der Nadelspitze, wenn der Lift-Schieber in der "▼"-Position ist, wurde vor der Auslieferung auf ungefähr 5-10 mm eingestellt.
Für die Benutzung anderer Tonabnehmer, die auf dem Markt erhältlich sind, oder, falls eine weitere Justierung unbedingt erforderlich ist, nehmen Sie die Justierung auf folgende Weise vor:

1. Stellen Sie den Geschwindigkeits-Wahlschleber in die "•"-Position, damit sich der Plattenteller nicht dreht.
2. Setzen Sie den Nadelschutz auf, falls mit einem solchen ausgestattet, um die Nadelspitze vor Beschädigung zu schützen.
3. Drehen Sie die Justierschraube im Uhrzeigersinn oder Gegenuhrzeigersinn, währenddem Sie die Tonarmliftführung nach unten drücken. **(Vgl. Abb. 14.)**
   Im Uhrzeigersinn
   —Der Abstand wird kleiner.
   Im Gegenuhrzeigersinn
   —Der Abstand wird größer

   Anmerkung:
   - Da die Justierschraube einen Sechskantkopf hat, muß die Tonarmliftführung während dem Justieren unbedingt gedrückt gehalten werden.
     Vergewissern Sie sich, daß der Sechskantkopf in die Tonarmliftführung zurückkehrt, wenn diese losgelassen wird.

Geschwindigkeits-Feineinstellung (mittels der Feineinsteller)

Die Stroboskoppunkte sind auf dem Plattentellerrand entsprechend der Stromfrequenz und der Drehzahl der Schallplatten angebracht. Richten Sie sich bei der Drehzahl-Feineinstellung nach dem Stroboskopbild.

1. Legen Sie eine Schallplatte auf den Plattenteller.
2. Stellen Sie den Geschwindigkeits-Wahlschieber auf die zu regulierende Geschwindigkeit ein.
3. Regulieren Sie die Geschwindigkeit während dem Abspielen der Platte.

Die Stroboskoplampe/ Einschaltkontrollampe leuchtet zur Beleuchtung der Stroboskoppunkte.
Regulieren Sie durch Drehen der Einstellknöpfe in "+" oder "—" Richtung, solange, bis die Stroboskoppunkte den Anschein vermitteln, daß sie stillstehen. Der Zustand, in dem die Stroboskoppunkte scheinbar stationär verbleiben, stellt die korrekte Drehgeschwindigkeit dar.

"+" Richtung
Die Drehgeschwindigkeit des Plattentellers erhöht sich und die Stroboskoppunkte scheinen in der gleichen Richtung zu laufen, wie der Plattenteller.
"—" Richtung
Die Drehgeschwindigkeit des Plattentellers verringert sich, und die Stroboskoppunkte laufen in der, der Drehrichtung des Plattentellers entgegengesetzten Richtung.

Anmerkung:
Stroboskoppunktemuster
- Die stroboskoplampe/ Kontrollampe dieses Gerätes arbeitet mit normalem Netzstrom. Die Frequenz dieser Stromquelle besitzt einen Schwankungsbereich von 0.2%. Da eine solche Schwankung der Stromquelle die Stroboskoplampe beeinflußt, scheint das Punktemuster auch zu einem gewissen Grad zu fließen. Die Drehzahl des Plattentellers wird jedoch durch diese Schwankung nicht beeinflußt, da ein Gleichstrommotor den Plattenteller antreibt.
  Anders ausgedrückt, die Umdrehungsgeschwindigkeit des Plattentellers bleibt konstant, und die geringfügige Bewegung des Stroboskoppunktemusters entspricht lediglich der normalen Schwankung der Netzfrequenz.

Einstellen des Aufsetzpunktes und des Abschaltpunktes der Automatik. (Vgl. Abb. 15.)

Falls der Tonarm nicht korrekt funktioniert, nehmen Sie die nötigen Justierungen auf folgende Weise vor.

Einstellen des Tonarmaufsetzpunktes der Automatik
(Gummikappe abnehmen.)
Falls der Aufsetzpunkt außerhalb der Platten liegt.
—Im Uhrzeigersinn drehen.
Falls der Aufsetzpunkt im Wiedergabeteil der Platte liegt.
—Im Gegenuhrzeigersinn drehen.

Einstellen der Abschaltpunktes der Automatik
(Die Plattentellerauflage abnehmen.)
Falls der Tonarm zu früh zurückkehrt.
—Im Uhrzeigerrichtung drehen.
Falls der Tonarm nach erreichen der Auslaufrille nicht zurückkehrt.
—Im Gegenuhrzeigerrichtung drehen.

REGLAGES

Réglages de l'équilibrage horizontal zéro ("0") et de la pression de la pointe de lecture.

1. Avant de régler l'équilibrage horizontal à la position "0", vérifier les points suivants:
- S'assurer que la manette sélectrice de vitesse est sur la position "•" (neutre).
- S'assurer que la manette de pose et de relevage est sur une position abaissée.
- S'assurer que la bague de réglage de la poussée latérale est sur la position "0".
2. Retirer le capot de la pointe de lecture, si votre cellule en possède un qui soit détachable.
   Prendre soin de ne pas toucher avec les doigts l'extrémité de la pointe de lecture.
3. Libérer le bras de son clip de retenue et soulever le bras de pick-up du support du bras pour le dégager.
   Tourner le contrepoids d'équilibrage entier dans le sens des aiguilles d'une montre (indiqué par la flèche "A") ou dans le sens contraire (indiqué par la flèche "B"), jusqu'à ce que le bras se maintienne approximativement à l'horizontale (flottant librement). **(Voir Figs. 9 et 10.)**
   Lorsque vous déplacez le bras de lecture vers le pivot central, le plateau de lecture se mettra légèrement en marche, même si la manette sélectrice de vitesse est à la position "•", mais ce mouvement est négligeable.

Nota:
- Pendant le réglage de l'équilibrage horizontal à la position "0", faire attention à ce que l'extrémité de la pointe de lecture de la cellule ne vienne pas à toucher le tapis du plateau ni le support de la platine.

4. Une fois l'équilibrage horizontal "0" réalisé, refixer momentanément le bras de lecture dans son dispositif de fixation. **(Voir Fig. 11.)**
5. Maintenir immobile le contrepoids d'équilibrage avec une main, comme indiqué sur l'illustration, et faire tourner la bague de réglage de pression de la pointe de lecture seule, de façon à amener le chiffre "0" de la bague en regard avec l'axe du pivot arrière du bras de lecture. Le réglage de l'équilibrage horizontal "0" est maintenant achevé. **(Voir Fig. 11.)**
6. Après le réglage de l'équilibrage horizontal "0", faire tourner le contrepoids d'équilibrage dans le sens des aiguilles d'une montre en direction de la flèche et aligner pour une pression de la pointe de lecture correcte. **(Voir Fig. 12.)**
   (Suivre les indications des Fabricants de cellules). **(Voir Fig. 12.)**
   Comme la bague de pression de la pointe de lecture se déplace par palier avec le contrepoids d'équilibrage, la pression appropriée de la pointe de lecture peut être choisie en lisant directement sur la bague graduée.

Nota:
- Régler la pression de la pointe de lecture sur la valeur maximale recommandée pour votre cellule dans le cas où le niveau d'enregistrement du disque est très élevé, ou lorsque l'appareil est utilisé dans une pièce à basse température, ou bien encore lorsque la platine est placée dans un endroit sujet à des vibrations.

Mise au point du réglage de la poussée latérale.

Régler la bague de réglage de la poussée latérale à la même valeur que celle de la pression d'appui de la pointe de lecture. **(Voir Fig. 13.)**

Nota:
- Lorsqu'une cellule pick-up est utilisée avec un balai à poussière intégré, suivre les instructions du fabricant pour le réglage à la fois de la pression d'appui de la pointe et de la force de poussée latérale.

Mise au point de la hauteur de l'élévateur du bras. (Voir Fig. 14.)

- La hauteur du bras élévateur (distance entre l'extrémité de la pointe de lecture et la surface du disque lorsque la manette de pose et de relevage est sur "▼") a été mise au point en usine avant d'être expédiée, sur une hauteur approximative de 5 à 10 mm.
- Lorsqu'on utilise une des diverses cellules pick-up disponibles sur le marché ou lorsqu'une mise au point ultérieure est particulièrement nécessaire, faire le réglage de la façon suivante:

1. Régler la manette sélectrice de vitesse sur la position "•", pour empêcher la rotation du plateau de lecture.
2. Placer le dispositif protecteur de la pointe de lecture, s'il y en a un, pour protéger la tête de la pointe d'une éventuelle détérioration.
3. Tourner la vis de réglage dans le sens des aiguilles d'une montre ou dans le sens inverse, tout en abaissant l'élévateur du bras. (Voir Fig. 14.)

Rotation dans le sens des aiguilles d'une montre.
—La distance entre la surface du disque et l'extrémité de la pointe de lecture diminue.
Rotation dans le sens contraire des aiguilles d'une montre.
—La distance entre la surface du disque et l'extrémité de la pointe de lecture augmente.

Nota:
- Comme la vis de réglage possède une tête hexagonale, s'assurer d'effectuer la mise au point tout en abaissant l'élévateur du bras, sinon la vis ne bougera pas librement. Vérifier aussi que la tête hexagonale se retire correctement dans l'élévateur du bras quand ce dernier est libéré.

Réglage de la vitesse (avec les boutons de réglage de vitesse).

Les points du stroboscope se trouvent disposés sur le bord du plateau du tourne-disque en fonction de la fréquence de réseau et de la vitesse des disques. Effectuer le mise au point, en se référant aux indications des points stroboscopiques.

1. Disposer la manette sélectrice de vitesse sur la vitesse devant être mise au point.
2. Libérer le dispositif de fixation du bras et déplacer le bras de lecture vers le disque. La lampe-témoin/éclairage du stroboscope s'allumera et le plateau commencera à tourner.
3. Il faut tourner les boutons de réglage de vitesse suffisamment, soit dans le sens "+" soit dans le sens "—", pour que les points du stroboscope du plateau de lecture paraissent stationnaires.
   L'état dans lequel les points du stroboscope paraissent immobiles représente le nombre correct de révolutions.

Sens "+"
La vitesse du plateau augmentera. Tourner le bouton dans cette direction si les points stroboscopiques semblent **"reculer"**, c'-à-d. se déplacer dans le sens inverse des aiguilles d'une montre. Lorsque les points paraissent immobiles, la vitesse du plateau est exacte.
Sens "—"
Ce sens diminue la vitesse de rotation du plateau. Tourner le bouton dans cette direction si les points stroboscopiques semblent **"s'écouler vers l'avant"**, c'-à-d. se déplacer dans le sens des aiguilles d'une montre jusqu'à ce qu'ils paraissent stationnaires.

Nota:
Image des points stroboscopiques
- La lampe témoin/éclairage du stroboscope de cet appareil utilise une alimentation disponible commercialement.
  S'il se produit une vibration de la fréquence du courant d'alimentation de l'appareil, is se peut que l'on observe un léger déplacement des points du stroboscope.
  Bien que le courant du secteur soit en général très stable en ce qui concerne la fréquence, si l'on procède à des mesures précises sur une durée suffisamment longue, il est possible d'observer une variation que, en moyenne, est de l'ordre de 0,2% . Ce sont ces variations qui provoquent le déplacement des points du stroboscope.
  Mais l'appareil n'est pas affecté par ces variations, étant donné qu'un moteur à courant continu est utilisé. En d'autres mots, la rotation du plateau restera constante, et les légères variations dans le mouvement des points ne reflètent simplement qu'une déviation normale dans la fréquence de la source d'énergie.

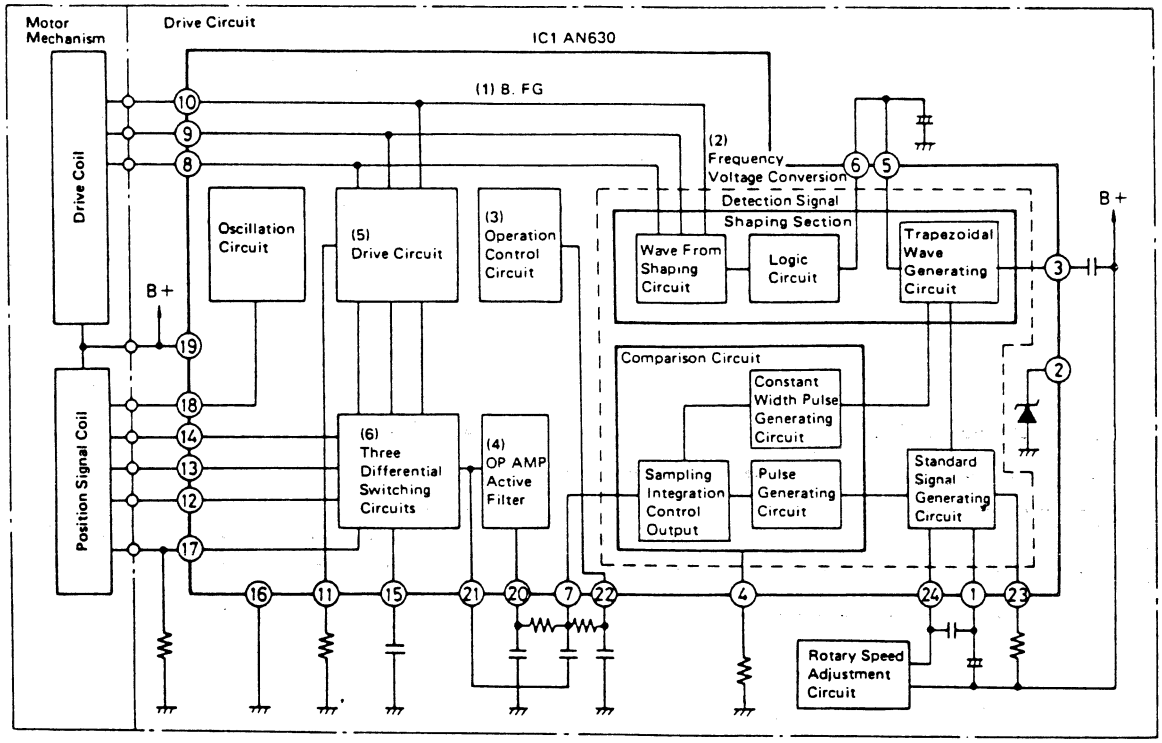
Réglages pour les positions de retour et de démarrage automatiques. (Voir Fig. 15.)

Dans le cas où le bras de lecture ne fonctionnerait pas convenablement faire les mises au point appropriées selon les procédures suivantes.

Mise au point pour une position de marche automatique.
(Retirer le capuchon en caoutchouc.)
Dans le cas où la tête de la pointe de lectures s'abaisse en dehors du disque.
—Tourner dans le sens des aiguilles d'une montre.
Dans le cas où la tête de la pointe de lecture s'abaisse à mi-distance d'une enregistrement.
—Tourner dans le sens contraire des aiguilles d'une montre.

Mise au point pour une position de retour automatique.
(Retirer le tapis du plateau de lecture.)
Dans le cas où le bras de lecture tend à revenir avant que l'audition ne soit terminée.
—Déplacer dans le sens des aiguilles d'une montre.
Dans le cas où le bras de lecture ne peut revenir en arrière aprés le dernier sillon du disque.
—Déplacer dans le sens contraire des aiguilles d'une montre.

■ BLOCK DIAGRAM



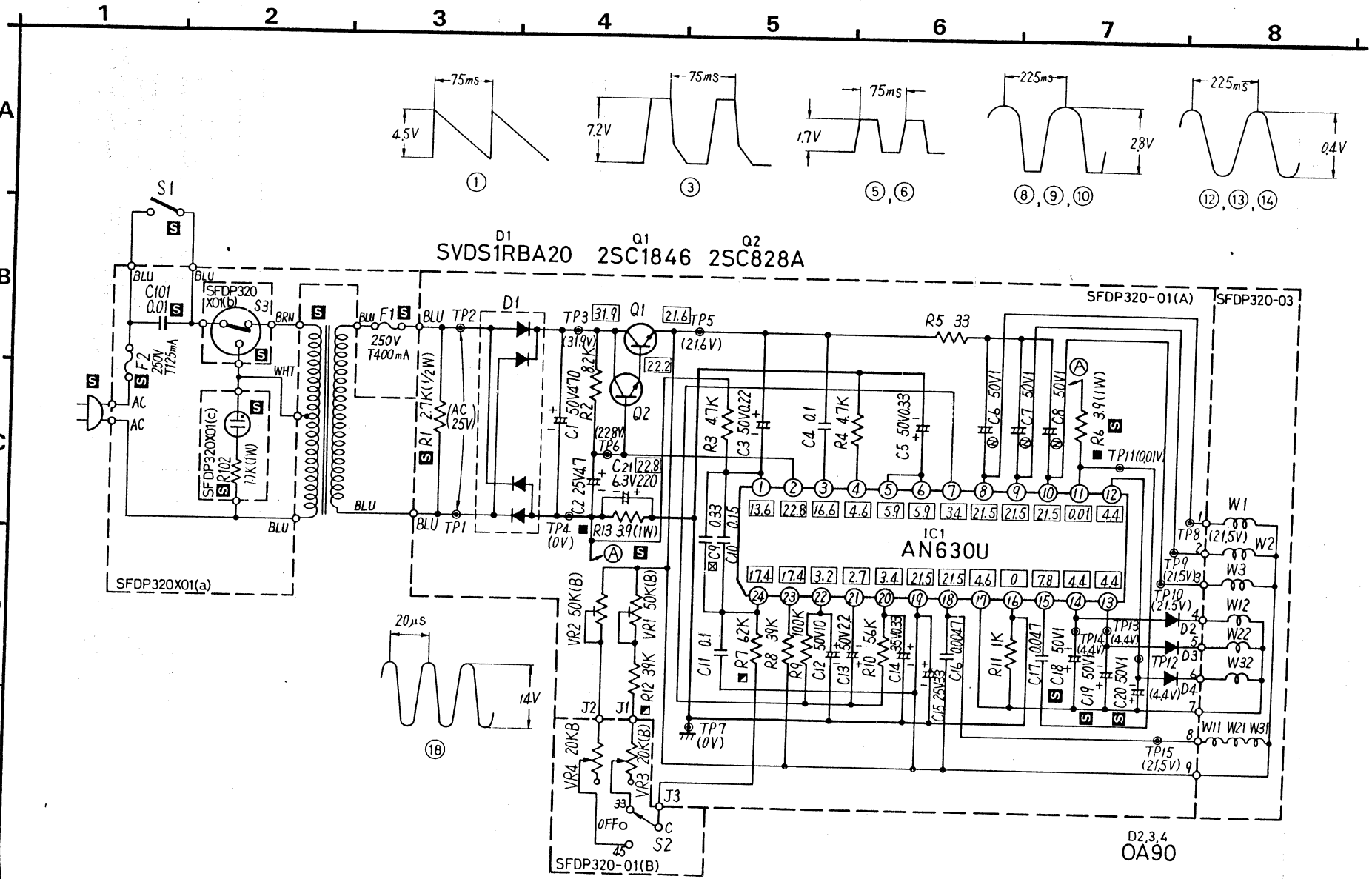
■ REPLACEMENT PARTS LIST

Notes:
1. Part numbers are indicated on most mechanical parts. Please use this part number for parts orders.
2. **S** indicates that only parts specified by the manufacture be used for safety.
3. SL-3300 (X) → [X] SL-3300 [XG] → [XG] SL-3300 (XGE) → [XGE] SL-3310 [E] → [10E]
   SL-3300 (XAL) → [XAL] SL-3300 [XGF] → [XGF] SL-3300 (E) → [E] SL-3310 [XG] → [10XG]

Ref. No.		Part No.	Part Name & Description
INTEGRATED CIRCUIT			
IC1		AN630U	Integrated Circuit
TRANSISTORS			
Q1		**2SC1846-Q**	Transistor
Q2		**2SC1328-T**	Transistor
DIODES			
D1	S	SVDS1RBA20	Rectifier
D2, 3, 4		OA90	Diodes
TRANSFORMER			
T1	S	SLTF5352A	Power Transformer
LAMP			
NL1	S	SFDNE2HU	Neon Lamp
SWITCHES			
S1 [X, XG, 10XG, XGF]	S	SFDSAH764039	Switch,Power
S1 [XAL, XGE, E, 10E]	S	V-1A445	Switch, Power
S2		EVAL06SBBAAF	Switch, Speed Selector
S3	S	SFDSHXW13312	Switch, Power Source Selector
FUSE			
F1	S	XBA2C04TRO	400mA, Fuse
F2	S	XBA2C012TRO	125mA, Fuse
VARIABLE RESISTORS			
VR1, 2		EVLS3AA00B54	50kΩ, Pitch Control
VR3, 4		EVHX8AF15B24	20kΩ, Speed Control

Ref. No.		Part No.	Part Name & Description		
RESISTORS					
R1	S	ERD50TJ272	Carbon, 2.7kΩ,	1/2W,	± 5%
R2		ERD25TJ822	Carbon, 8.2kΩ,	1/4W,	± 5%
R3, 4		ERD25TJ472	Carbon, 4.7kΩ,	1/4W,	± 5%
R5		ERD25TJ330	Carbon, 33Ω,	1/4W,	± 5%
R6	S	ERX1ANJ3R9	Metallic, 3.9Ω,	1W,	± 5%
R7		ERO25CKF6202	Metallic, 62kΩ,	1/4W,	± 1%
R8		ERD25TJ393	Carbon, 39kΩ,	1/4W,	± 5%
R9		ERD25TJ104	Carbon, 100kΩ,	1/4W,	± 5%
R10		ERD25TJ563	Carbon, 56kΩ,	1/4W,	± 5%
R11		ERD25TJ102	Carbon, 1kΩ,	1/4W,	± 5%
R12		ERO25CKF3902	Metallic, 39kΩ,	1/4W,	± 1%
R13	S	ERX1ANJ3R9	Metallic, 3.9Ω,	1W,	± 5%
R102	S	ERG1ANJ103	Metallic, 10kΩ,	1W,	± 5%
CAPACITORS					
C1		ECEB1HS471	Electrolytic, 470μF,	50V	
C2		ECEA1JS4R7	Electrolytic, 4.7μF,	63V	
C3		ECEA50ZR22	Electrolytic, 0.22μF,	50V	
C4		ECQM1H104KZ	Polyester, 0.1μF,	50V,	±10%
C5		ECEA50ZR33	Electrolytic, 0.33μF,	50V	
C6, 7, 8		ECEA50N1	Electrolytic, 1μF,	50V	
C9	S	ECQF2334KZ	Polyester, 0.33μF,	200V,	±10%
C10		ECQM1H154KZ	Polyester, 0.15μF,	50V,	±10%
C11		ECQM1H104KZ	Polyester, 0.1μF,	50V,	±10%
C12		ECEA25M10R	Electrolytic, 10μF,	25V	
C13		ECEA50M2R2R	Electrolytic, 2.2μF,	50V	
C14		ECSZ35EFR33E	Electrolytic, 0.33μF,	35V	
C15		ECEA1VS330	Electrolytic, 33μF,	35V	
C16		ECEM1H472KZ	Polyester, 0.0047μF,	50V,	±10%
C17		ECQM1H473KZ	Polyester, 0.047μF,	50V,	±10%
C18 19, 20	S	ECEA2AS010	Electrolytic, 1μF,	100V	
C101 [X, XG, 10XG, XGF]	S	ECQE2A103MZ	Polyester, 0.01μF,	250V,	±20%
C101 [XAL, XGE, E, 10E]	S	ECKDHS103SE2	Polyester, 0.01μF,	250V,	±20%

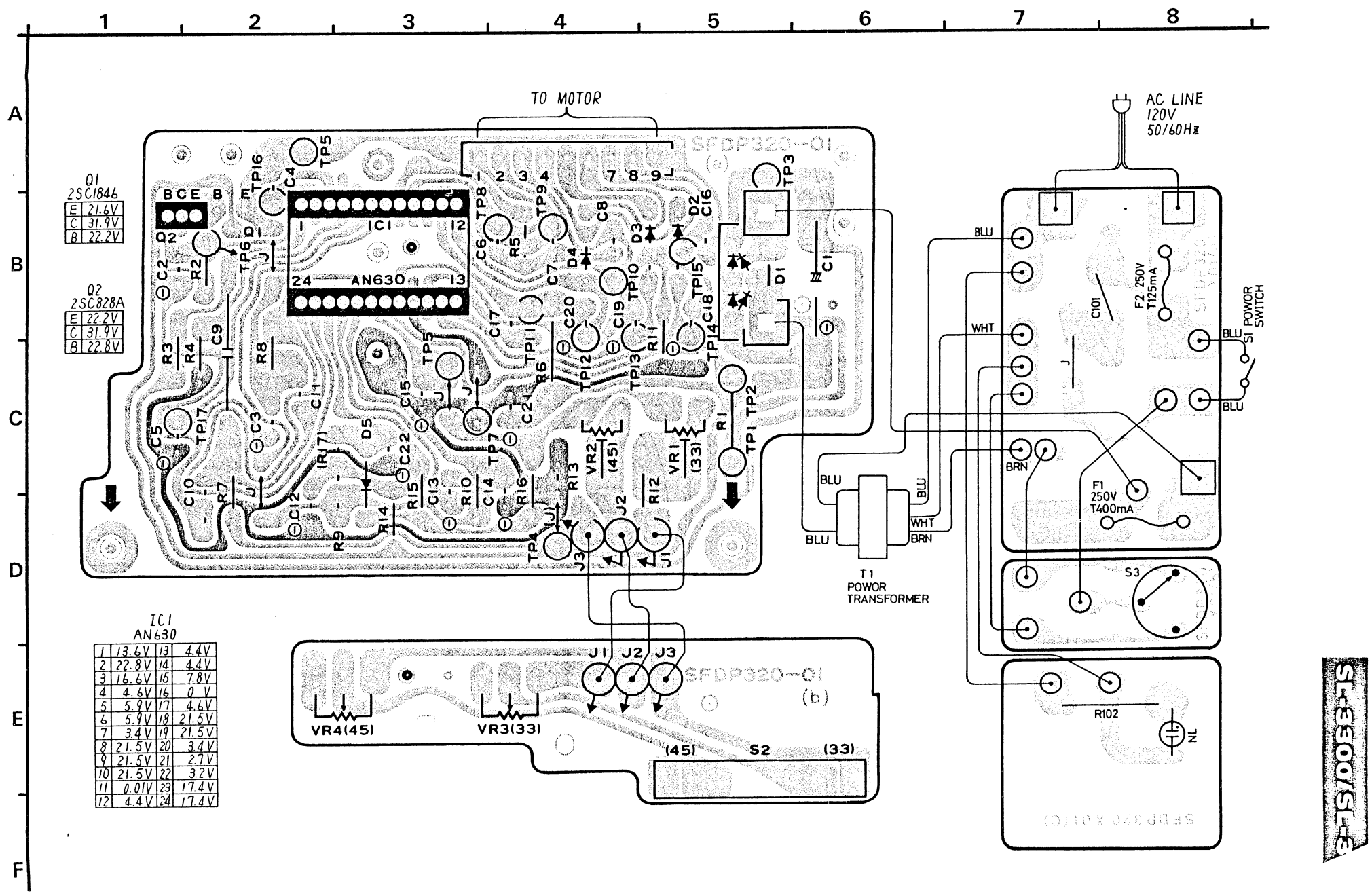
Schematic Diagram (This schematic diagram may be at any time with the development of new technology.)



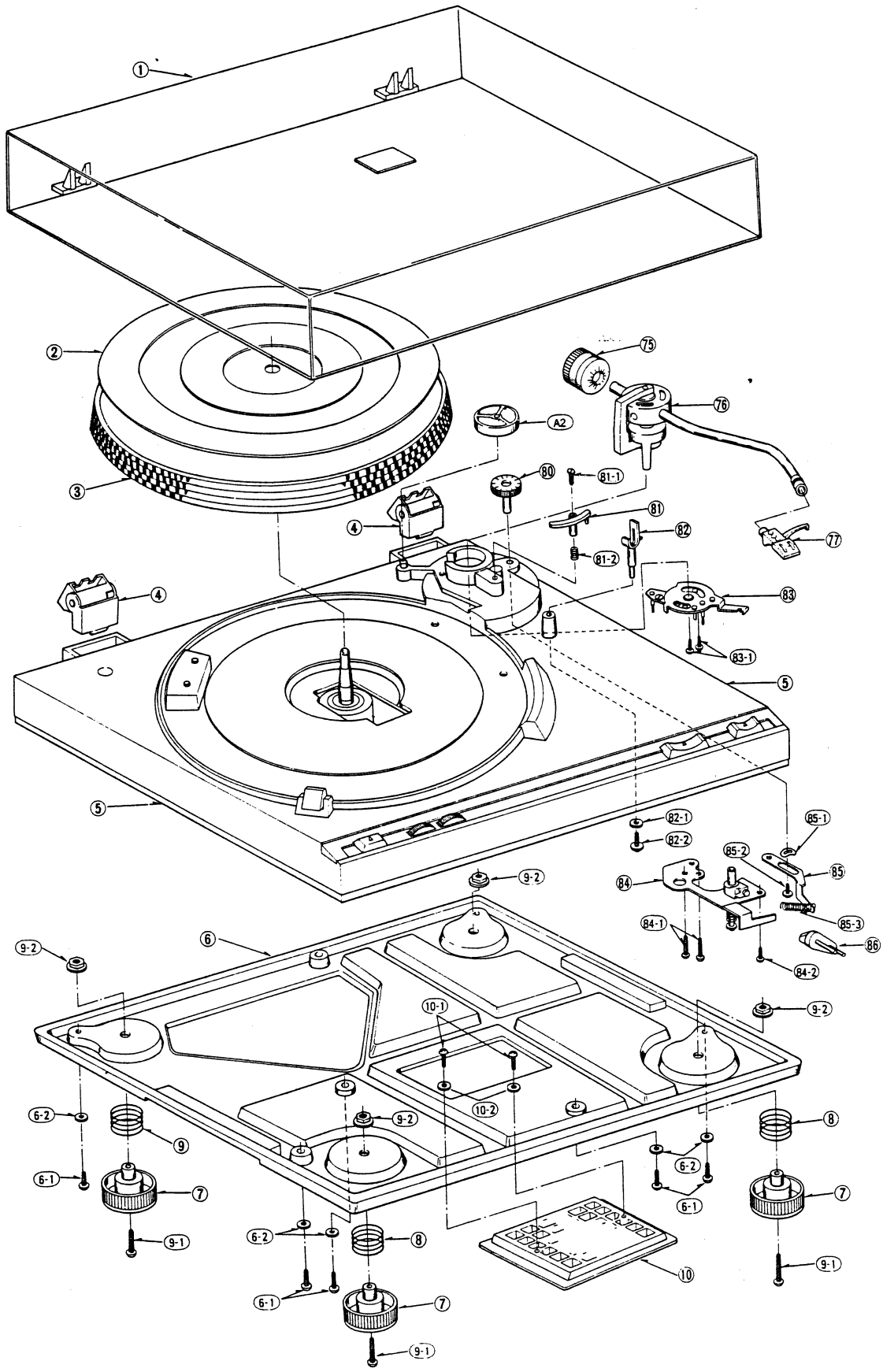
Notes:

1. S1 : Power switch in "OFF" position.
2. S2 : Speed selector switch in 33-1/3 rpm position.
3. S3 : Power source switch in "220-240V" position.
4. **S** indicates that only parts specified by the manufacturer be used for safety.
5. The voltage value entered are the values measured from the chassis with a standard tester that has

Printed Circuit Board



■ EXPLODED VIEWS



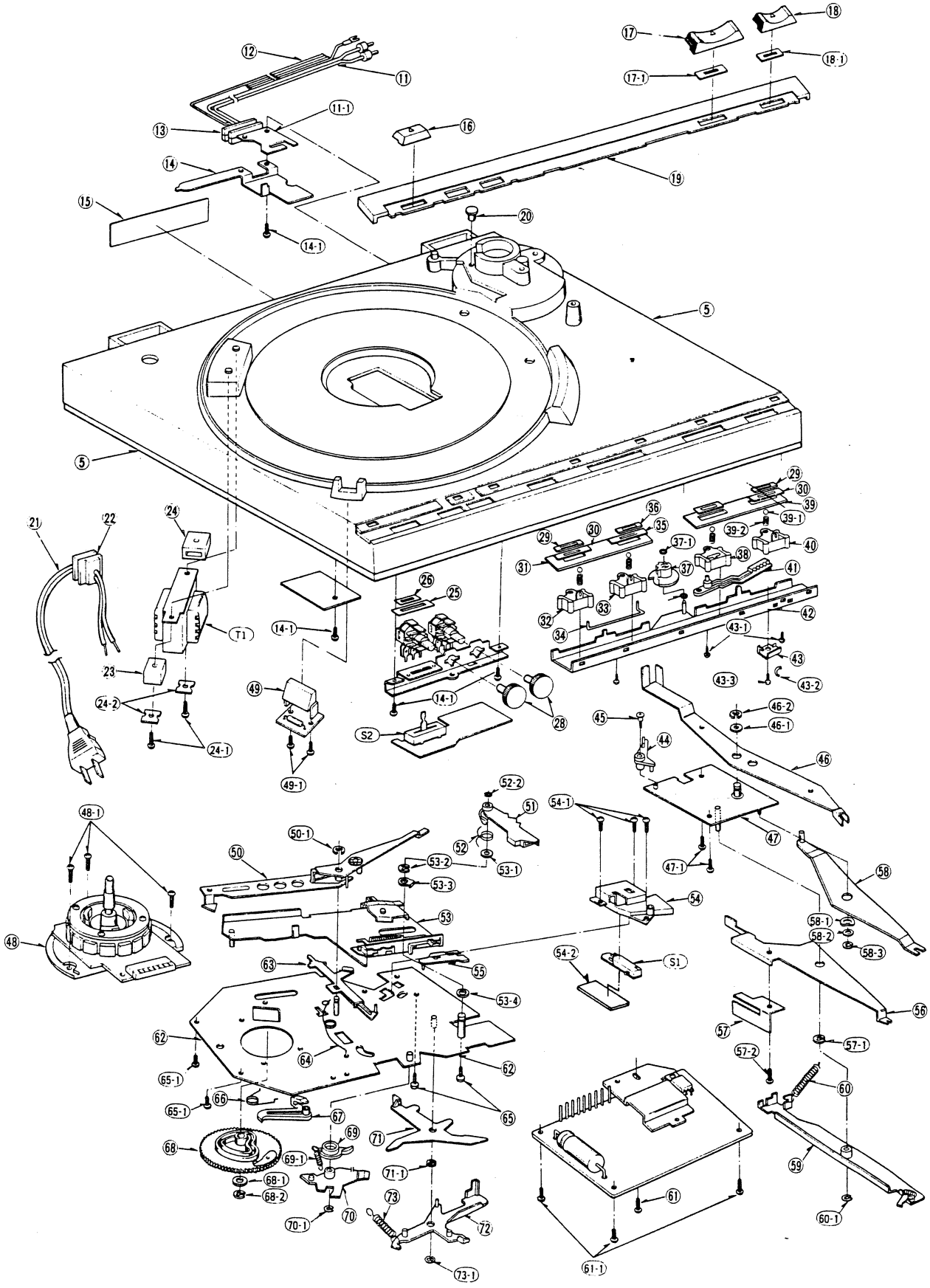
REPLACEMENT PARTS LIST

Notes: 1. Part numbers are indicated on most mechanical parts.
Please use this part number for parts orders.
2. **S** indicates that only parts specified by the manufacture be used for safety.

3. SL-3300 (X) → [X] SL-3300 (XG) → [XG] SL-3300 (XGE) → [XGE] SL-3310 (E) → [10E]
SL-3300 (XAL) → [XAL] SL-3300 (XGF) → [XGF] SL-3300 (E) → [E] SL-3310 (XG) → [10XG]

Ref. No.		Part No.	Part Name & Description
CABINET and CHASSIS PARTS			
1		SFAD019-01E	Dust Cover
2		SFTG320-01	Turntable Mat
3		SFTE320-01A	Turntable
4		SFAT301-01A	Hinge Ass'y
5 [X, XAL, XG, E, XGE, XGF]		SFAC320-01	Cabinet (Silver)
5 [10E, 10XG]		SFAC320P01	Cabinet (Black)
6		SFAU320-01	Bottom Board
6-1		XTN3+20B	Screw, Bottom Board
6-2		XWG3	Washer, Bottom Board
7		SFGA212-01	Audio Insulator
8		SFQC200-02	Spring, Audio Insulator (Front)
9		SFQC320-01	Spring, Audio Insulator (Rear)
9-1		XSN3+14S	Screw, Audio Insulator
9-2		XNG3HS	Nut, Audio Insulator
10		SFUM320-02	Cover, Bottom Board
10-1		XTN3+8B	Screw, Cover
10-2		XWG3	Washer, Cover
11		SFDH212-01	Phono Cord
11-1		SFDP212-02	P.C.B., Phono Cord
12		SFEL028-01E	Ground Wire
13		SFUM212-08	Clamper, Phono Cord
14		SFUP320-01	Plate, Shield
14-1		XTV3+10C	Screw
15 [X, XG, 10XG, XGF]		SFNN330X01	Name Plate
15 [XAL, XGE]		SFNN330G01	Name Plate
15 [E, 10E]		SFNN330S01	Name Plate
16		SFKT320-03	Knob, Speed Select
17		SFKT320-01	Knob, Stop
17-1		SFXW212-02	Washer, Stop Knob
18		SFKT320-02	Knob, Cueing
18-1		SFXW212-01	Washer, Cueing Knob
19 [X, XAL, XGE, E, XG, XGF]		SFKK330-01	Panel
19 [10E, 10XG]		SFKK330P01	Panel
20 [X, XAL, XGE, E, XG, XGF]		SFGK170-01	Cap, Rubber
20 [10E, 10XG]		SFGK171F01	Cap, Rubber
21 [X, E, 10E, XG, 10XG, XGF]	**S**	RJA23ZC-K	AC Cord
21 [XAL]	**S**	QFC1208M	AC Cord
21 [XGE]	**S**	RJA45ZC-K	AC Cord
22 [X, E, XGE, XG, 10XG, 10E, XGF]		SFUM190-11	Bushing, AC Cord
22 [XAL]		SFUM190-12	Bushing, AC Cord
23		SFGC320-02	Supporter, Power Transformer (A)
24		SFGC320-03	Supporter, Power Transformer (B)
24-1		XTV3+10C	Screw, Power Transformer
24-2		SFUP320-04	Supporter, Power Transformer (C)
25		SFUP212-13	Shutter (A)
26		SFUP212-07	Shutter (B)
27		SFUP212-11	Plate, Speed Adjustment
28		SFKT212-02	Knob, Pitch Control
29		SFUP212-07	Shutter (B)
30		SFUP212-13	Shutter (A)
31		SFUM212-02	Plate, Operation
32		SFUM230-01E	Selector, Slider Ass'y
33		SFUM212-03E	Slider Ass'y, (A)
34		SFQS230-01	Selector Lod
35		SFUP230-01	Shutter (A), Repeat
36		SFUP230-02	Shutter (B), Repeat
37		SFUM230-04	Cam, Repeat
37-1		**XUC3FT**	Circlip, Repeat Cam
38		SFUP212-20E	Slider Ass'y, (B)
39		SFUM230-02	Plate, Repeat
39-1		SFYB5-32	Ball, Slider Ass'y
39-2		SFQA130-11	Spring, Slider Ass'y
40		SFUM212-03E	Slider Ass'y, (A)
41		SFUM230-03E	Repeat Ass'y
42		SFUK230-01E	Operation Support Ass'y
43		SFUP230-05	Bracket, Select Lod
43-1		XTN3+20C	Screw
43-2		SFGZ230-01	Rubber, Select Lod Bracket
43-3		XTN3+10B	Screw, Select Lod Bracket
44		SFUM230-07	Lever, Stop
45		SFPJK15002	Screw, Stop Lever
46		SFUP212-04	Lever, Cueing
46-1		SFXW190-22	Washer, Cueing
46-2		**XUC5FT**	Circlip, Cueing
47		SFUK230-02E	Plate, Cueing
47-1		XTV3+10C	Screw, Cueing Lever Plate
48		SFMZ320-01Z	Stater Frame Ass'y
48-1		XTN3+10B	Screw
49		SFUM320-01	Cover, Neon
49-1		XTN3+10B	Screw, Neon Cover
50		SFUC320-11E	Actuating Plate Ass'y
50-1		**XUC3FT**	Circlip, Actuating Plate Ass'y
51		SFUM230-12	Index Plate
52		SFQS230-11	Spring, Index Plate
52-1		SFXW831-5	Washer, Index Plate
52-2		**XUC5FT**	Circlip, Index Plate
53		SFUB230-11A	Operating Plate Ass'y
53-1		SFXW230-11	Washer, Operating Plate Ass'y
53-2		**XUC5FT**	Circlip, Operating Plate Ass'y
53-3		SFXW130-13	Washer, Operating Plate Ass'y
53-4		SFXW623-02	Washer, Operating Plate Ass'y
54		SFUM222-14	Cover, Switch
54-1		XTN3+8B	Screw, Switch Cover
54-2 [XAL, XGE, E, 10E]		SFUP222S11	Insulator, Switch
55		SFUM222-15	Plate, Switch
56		SFUP222-01	Lever, Start
57		SFQP230-01	Supporter, Start Lever
57-1		**XUC3FT**	Circlip, Start Lever
57-2		XTN3+5B	Screw, Start Lever
58		SFUP230-04E	Select Lever Ass'y
58-1		SFXW910-08	Washer, Select Lever Ass'y
58-2		XWE4G10	Washer, Select Lever Ass'y
58-3		**XUC3FT**	Circlip, Select Lever Ass'y
59		SFUP230-03A	Lever, Searching
60		SFQS230-13	Spring, Searching Lever
60-1		**XUC3FT**	Circlip, Searching Lever
61		XTN3+8B	Screw, Heat Sink
61-1		XTV3+10C	Screw, P.C.B.
62		SFUK320-11E	Automatic Mechanism Ass'y
63		SFUM222-13	Plate, Stop
64		SFQS222-12	Spring, Stop Plate
65		XTV3+35C	Screw, Automatic Mechanism Ass'y
65-1		XTV3+10C	Screw, Automatic Mechanism Ass'y
66		SFQS222-11	Spring, Supporter
67		SFUM222-11	Supporter, Gear Setting
68		SFUG190-22E	Main Gear Ass'y
68-1		SFXW890B01	Washer, Main Gear Ass'y
68-2		**XUC5FT**	Circlip, Main Gear Ass'y
69		SFUM230-14	Pin, Switch Supporter
69-1		SFQH130-14	Spring, Switch Supporter
70		SFUM230-13	Supporter, Switch
70-1		**XUC3FT**	Circlip, Switch Supporter
71		SFUM222-16	Lever, Switch
71-1		**XUC3FT**	Circlip, Switch Lever
72		SFUM230-11	Plate
73		SFQH910-11	Spring, Plate
73-1		**XUC3FT**	Circlip, Plate
TONE ARM			
75		SFPWG21001K	Balance Weight Ass'y
76		SFPAM31001K	Tone Arm Ass'y
77 [Except XGF]		SFPCC31002K	Head Shell
78 [Except XGF]		EPC270C2K-X	Cartridge
79 [Except XGF]		EPS270ED	Stylus
79-1 [Except XGF]		SFPEV9801	Screw, Cartridge
79-2 [Except XGF]		SFPEN3302	Nut, Cartridge
79-3 [Except XGF]		SFPEW9601	Washer, Cartridge
ARM BASE			
80		SFPJK19004	Knob, Anti-skate Force Control
81		SFPRT13004K	Lift Ass'y
81-1		SFXG829-1	Screw, Tone Arm Lift Adjustment
81-2		SFQA829-03	Spring, Lift Ass'y
82		SFKU212-01E	Arm Rest
82-1		XWG3	Washer, Arm Rest
82-2		XTN3+14BFZ	Screw, Arm Rest
83		SFUP320-05A	Tone Arm Fixing Plate Ass'y
83-1		SFPEV13204	Screw, Tone Arm Fixing Plate Ass'y
84		SFUP320-03A	Bracket, Lift Ass'y
84-1		XTN4+12B	Screw, Lift Ass'y Bracket
84-2		XTN3+10B	Screw, Lift Ass'y Bracket
85		SFUP212-02	Plate, Anti-skate Force Control
85-1		SFQP212-02	Washer, Plate
85-2		SFXG212-04	Screw, Plate
85-3		SFPSP13102	Spring, Anti-skate Force Control
86		SFUM212-01	Cam, Cueing

EXPLODED VIEWS



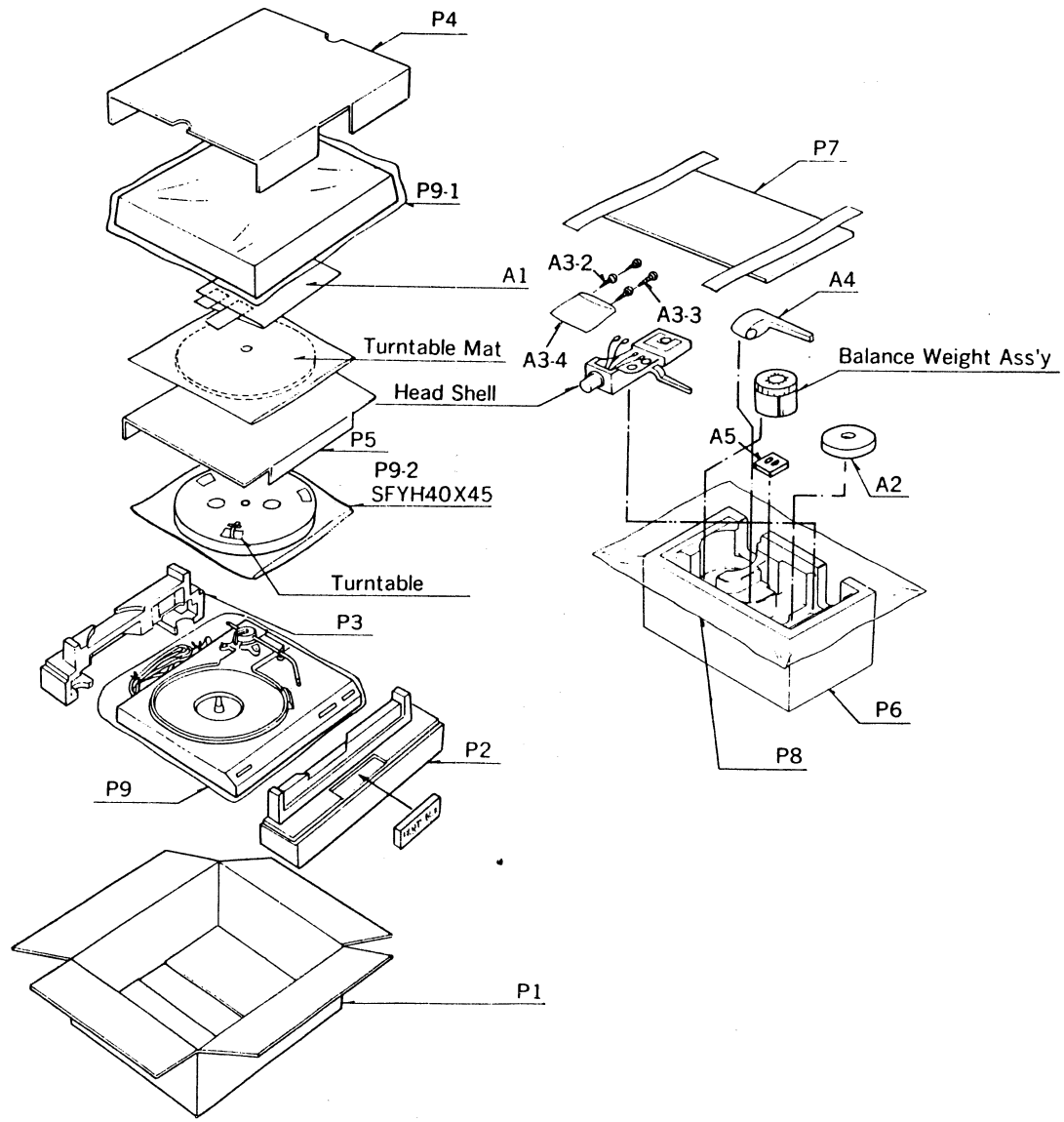
REPLACEMENT PARTS LIST

Notes:

SL-3300 (X)	→ [X]	SL-3300 (XG)	→ [XG]
SL-3300 (XAL)	→ [XAL]	SL-3300 (XGF)	→ [XGF]
SL-3300 (XGE)	→ [XGE]	SL-3310 (E)	→ [10E]
SL-3300 (E)	→ [E]	SL-3310 (XG)	→ [10XG]

Ref. No.		Part No.	Part Name & Description
ACCESSORIES			
A1 [X, XAL, E, 10E, XG, 10XG, XGF]		SFNU330X01	Instruction Book
A1 [XGE]		SFNU330G01	Instruction Book
A2		SFWE212-01	Adaptor, 45 r.p.m.
A3 [XGF]		SFPEN3302	Nut, Cartridge
A3-1 [XGF]		SFPEW9601	Washer, Head Shell
A3-2 [XGF]		SFCZV8801	Screw, Cartridge
A3-3 [XGF]		SFPEV9801	Screw, Cartridge
A3-4 [XGF]		SFYF05A06	Polyethylene Bag
A4 [XGF]		SFKO135X01E	Overhang Gauge
A5		SFPZB3501	Shell Weight
PACKING PARTS			
P1 [X, XAL, XG, E, XGE]		SFHP330X01	Carton
P1 [10E, 10XG]		SFHP331S01	Carton
P1 [XGF]		SFHP330J01	Carton
P2		SFHH320-01	Pad, Front
P3		SFHH320-02	Pad, Rear
P4		SFHD230-01	Pad, Top
P5		SFHD212-02	Pad, Turntable
P6		SFHH212-03	Parts Box
P7		SFHD212-03	Pad, Top, Parts Box
P8		SFYC22A30	Polyethylene Cover, Parts Box
P9		SFYF60A60	Polyethylene Bag, Player Unit
P9-1		SFYH60X60	Polyethylene Bag, Dust Cover
P9-2		SFYH40X45	Polyethylene Bag, Turntable

PACKINGS



Printed in Japan
7807-5000